

Claims

1. Ion accelerator system having an ionization chamber, an electrode arrangement, and a magnet arrangement, wherein
 - the ionization chamber has an ion exit opening in a longitudinal direction, and is delimited by at least one side wall crosswise to the longitudinal direction, and wherein working gas can be introduced into the ionization chamber by way of an introduction opening that is spaced at a distance from the exit opening,
 - the electrode arrangement contains at least one cathode and one anode, and generates an electrical field for accelerating positively charged working gas ions in the direction of the exit opening,
 - the magnet arrangement in the ionization chamber generates a magnetic field that has, in the longitudinal direction, at least one longitudinal segment of a second type, having a magnetic field direction essentially parallel to the longitudinal direction, and an adjacent longitudinal segment of a first type, having a

comparatively higher proportion of the field component perpendicular to the longitudinal direction,

- the wall distance between wall surfaces that stand opposite one another is less in the longitudinal segment of the second type than in the longitudinal segment of the first type,

characterized in that the wall progression in the longitudinal segment of the second type demonstrates a monotonously curved curvature towards the ionization chamber, in the longitudinal direction.

2. System according to claim 1, characterized in that the minimal distance between walls in the longitudinal segment of the second type is at least 15%, particularly at least 25%, less than the maximal distance between walls in the longitudinal segment of the first type.
3. System according to claim 1 or 2, characterized in that longitudinal segments of the first and the second type alternately follow one another.

4. System according to one of claims 1 to 3, characterized in that a reversal of direction of the longitudinal component of the magnet occurs in a longitudinal segment of the first type.
5. System according to one of claims 1 to 4, characterized in that in a longitudinal segment of the second type, the chamber wall is formed at least partly by an intermediate electrode.
6. System according to one of claims 1 to 5, characterized in that the anode is arranged at the end of the ionization chamber that lies opposite the exit opening, in the longitudinal direction.
7. System according to one of claims 1 to 6, characterized in that the cathode is configured as a primary electron source and is arranged laterally offset with reference to the exit opening, outside of the ionization chamber.
8. System according to one of claims 1 to 7, characterized in that the cathode is configured as a primary electron source and is arranged laterally offset with reference to the exit opening, outside of the ionization chamber.

9. System according to one of claims 1 to 7, characterized in that no external electron source is provided as a neutralizer or primary electron source.